

adjusting in real time at least one of the manufacturing process and the treatment process for the paper web based on input from the human operator, wherein the input from the operator is based on defects determined from the images.

REMARKS

This Amendment is filed in response to the Office Action dated March 18, 2003.

Applicant appreciates the Examiner's thorough examination of the application as evidenced by the Office Action. In response to the Office Action, Applicant has amended independent Claims 1, 23, and 24 to more clearly define the claimed invention. Applicant respectfully submits that the claims of the application are patentable over the cited references, and therefore, respectfully requests reconsideration and allowance of the application.

The Office Action rejects all of the claims under 35 U.S.C. § 103(a) in light of U.S. Patent No. 5,821,990 to Rudt in combination with the following references: U.S. Patent No. 5,822,070 to Syré; Tappi article by Vickery; U.S. Patent No. 5,011,573 to Niemi; U.S. Patent No. 5,118,195 to Dobbie, U.S. Patent No. 5,696,591 to Bilhorn et al., and U.S. Patent No. 5,563,809 to Williams et al. The '809 Williams patent is a newly cited reference against the claims. The Office Action admits that the earlier cited references do not disclose adjusting the process in real time based on the images from the camera. However, the Office Action alleges that the '809 Williams patent discloses this aspect and that it would be obvious to combine the disclosure of the '809 Williams patent with the other references. Applicant respectfully disagrees with these rejections in light of the following comments.

Applicant respectfully submits that the '809 Williams patent nowhere teaches or suggests that a human operator analyzes the images of the paper web and controls the paper machine based on detected defects from the images. Applicant agrees that the '809 Williams patent does disclose display of the images of the web to a human operator. See '809 Williams patent, col. 17, line 66 – col. 18, line 9. Further, Applicant acknowledges that the '809 Williams patent discloses an operator's console having a processor that controls operation of the machine. See '809 Williams patent, col. 7, line 61-col. 8, line 6. However, there is no teaching or suggestion that the operator adjusts the paper machine based on the images produced by the cameras. In

contrast, the '809 Williams patent appears to teach displaying image information to a user in a monitoring function, but controlling the paper machine using a controller that is not operated by the machine operator.

For example, in the summary of the invention, the display of data to the operator is disclosed as a different embodiment from that of the embodiment of controlling the process. The summary of the '809 Williams patent states the following:

Preferably, the step of monitoring the sheet material at a location substantially adjacent to initial processing thereof is performed across the entire width of the sheet material. The method may further comprise the steps of: storing the physical property information in a memory; processing the physical property information stored in the memory to generate image signals; and, displaying the image signals.

The method may still further comprise the steps of: passing the physical property information to a controller for controlling manufacture of the sheet material to maintain uniformity of the sheet material; monitoring the sheet material at a location substantially adjacent to final processing of the sheet material to generate sheet signals representative of a given characteristic of the sheet material; and, controlling the machine in response to the sheet signals to further control the absolute value of the given characteristic of the sheet material.

See '809 Williams patent, col. 3, lines 31-47. This passage indicates that the data is displayed to the operator for monitoring, but that the data is then passed or provided to a controller for actual adjustment of the process.

This difference is also noted in the passage cited by the Office Action. Specifically, the Office Action cites language appearing at col. 17, lines 14-23 as disclosing use of the image data by an operator to control the process. However, as stated later in that discussion:

Advantageously, the stationary web sensor 132 can be utilized to measure and **display** the web 102 at its wet end **to permit an operator of the system to evaluate one or more characteristics or properties of the web 102. . . . The video signals, generated and processed as disclosed above, can also be used to control one or more characteristics and properties of the web 102. . . .**

Since measurements made at the wet end of the machine can not accurately determine the ultimate product which is produced and wound onto the collecting reel 124, the absolute characteristics and properties of the web 102 cannot be assured by such control using the stationary web sensor 132. **However, by utilizing any of a number of conventional control systems, variability can**

be substantially eliminated such that a very consistent product or web 102 is produced.

... A control system responsive to web signals from sensors at both the wet and dry ends of the machine 100 can then control the machine to maintain uniformity and an absolute value of one or more given characteristics of the web 102.

Col. 17, line 66 – col. 18, lines 33. Here again, Applicant submits that the '809 Williams patent makes a distinction between displaying the data to an operator and controlling the process in light of the data. Specifically, it discloses one system for displaying the data to a user and a separate controller for controlling the process. It nowhere teaches or suggests that the controller is operated by the human operator. Instead, the '809 Williams patent may be read as allowing an operator to monitor the process, but that control based on the images is completely automated by a processor.

This distinction between display of data to the user and providing the data to a controller for controlling the process is also noted from the claims of the '809 Williams patent. Specifically, Claims 1-12 recite measuring a property of the paper web. This set of claims includes two dependent claims, namely Claims 4 and 12, that recite displaying the data to a user. The patent includes a separate set of claims, (14-26), that recite a method for controlling the paper machine. This second set of claims nowhere recites displaying the data to the user. Further, Claim 14 of this set specifically recites that the controller is "responsive solely to said web signals for controlling said machine to maintain uniformity in said web of sheet material." Indicating that control is based on the signals alone and not on user input.

Finally, the summary of the invention further states that they system independently controls the uniformity of the web, wherein characteristics of the sheet material are absolutely controlled by signals from a sensor monitoring the web. See Col. 6, lines 58-64. Further indicating that the user does not provide input for controlling the paper process.

In summary, amended independent Claims 1, 23, and 24 all recite that adjustments are made to the process based on inputs from a human operator. The '809 Williams patent nowhere teaches or suggests using user input to control the paper process based on the image data. As none of the other cited references teach or suggest this recitation, Applicant respectfully submits

that independent Claims 1, 23, and 24, as well as the claims that depend therefrom, are patentable over the cited references.

CONCLUSION

In view of the amended figure and claims and the remarks presented above, it is respectfully submitted that all of the present claims of the application are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicant's undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,



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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Non Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on June 18, 2003

Elaine Kelly

CLT01/4596736v1

Version with Markings to Show Changes Made:

In The Claims:

Please amend Claims 1, 23, and 24 as follows:

1. (Thrice Amended) A method for monitoring and controlling quality of a paper web as the paper web is being manufactured, comprising:

conveying the paper web through a paper machine where the paper web is formed as part of a manufacturing process and treating the paper web by subjecting the paper web to a treatment process;

imaging the paper web with a thermal camera on a continual basis;

displaying the images to a human operator in real time;

analyzing images from the thermal camera in real time as the images are captured by the thermal camera on a continual basis in order to detect defects in the paper web based on the images; and

adjusting in real time at least one of the manufacturing process and the treatment process for the paper web based on input from the human operator, wherein the input from the operator is based on [the detected] defects determined from the images.

23. (Amended) A method for monitoring and controlling quality of a paper web as the paper web is being manufactured, comprising:

conveying the paper web through a paper machine where the paper web is formed as part of a manufacturing process and thereafter treating the paper web by subjecting the paper web to a treatment process;

imaging the paper web with a thermal camera in real time as the paper web is manufactured;

displaying the images to a human operator in real time;

analyzing images from the thermal camera in real time as the images are captured by the thermal camera to detect defects in the paper web based on the images; and

adjusting in real time at least one of the manufacturing process and the treatment process for the paper web based on input from the human operator, wherein the input from the operator is based on [the detected] defects determined from the images.

24. (Amended) A method for monitoring and controlling quality of a paper web as the paper web is being manufactured, comprising:

conveying the paper web through a paper machine where the paper web is formed as part of a manufacturing process and thereafter treating the paper web by subjecting the paper web to a treatment process;

imaging the paper web with a thermal camera as the paper web is manufactured;

displaying the images to a human operator;

analyzing images from the thermal camera as the images are captured by the thermal camera;

detecting defects in the paper web directly from the images as they are captured such that there is not a requirement to store the images for later analysis; and

adjusting in real time at least one of the manufacturing process and the treatment process for the paper web based on input from the human operator, wherein the input from the operator is based on [the detected] defects determined from the images [in said detecting step].